

## **REMARKS**

Claims 1-9, 19-29 and 32-59 were examined and rejected. The drawings are objected to, and the Specification is objected to. Applicant amends the Specification; and claims 4, 7, 19, 23-25, 29, 32, 36-38, 42, 46, 49 and 56-58. Applicant asserts that no new matter is added herein (e.g., amended claim 56 is supported by Figure 1a as originally filed, and amended claim 58 is supported by paragraph 62 as originally filed). Applicant cancels claims 5, 20, 28, 41, 47, and 53-55. Applicant respectfully request reconsideration of claims 1-4, 6-9, 19, 21-27, 29, 32, 34-40, 42-46, 48-52 and 56-59 in view of at least the following remarks.

Applicant encloses for the Patent Office in an IDS a copy of the missing article by Jaffray ("Cone-Beam CT: Application in Image Guided External Beam Radiotherapy and Brachytherapy") as cited on Sheet 6 of 9 in the IDS filed 4:19/04, for your files.

### **I. Drawings**

The Patent Office objects to drawings for failing to comply with 37 C.F.R. §1.84(p)(5) because they include reference characters "400", "500" and "600" not mentioned in the description. Applicants amend the Specification to include reference to these characters. Thus, Applicant respectfully request the Patent Office withdraw the objection above.

The Patent Office objects to Figures 1a and 1b as failing to comply with 37 C.F.R. §1.84(p)(3) because the numbers, letters, and reference characters do not measure at least 1/8 inch in height. Applicant provides the attached formal drawings as replacement sheets and asserts that they are proper. Thus, Applicant respectfully requests the Patent Office withdraw the objection above.

## **II. Specification**

The Patent Office objects to the Abstract because in line 4 the phrase "According another embodiment", the word "to" should be inserted. Applicant amends the Specification to incorporate the appropriate correction. Thus, Applicant respectfully requests the Patent Office withdraw the objection above.

Also, the Patent Office objects to the specification because at paragraph 38, line 6, the phrase "accomplished is necessary." should read "accomplished if necessary." Applicant has updated that phrase as suggested. Hence, Applicant respectfully request the Patent Office withdraw the objection above.

## **III. Claim Objections**

The Patent Office objects to claims 4, 7, 23-24, 28-29, 32, 36-37, 41-42, 44, 47, 49, 53 and 58 because of informalities.

The Patent Office objects to claim 4, line 3 and recommends deleting "the" from "simulate the execution." Applicant amends claim 4 to incorporate the suggested recommendation, and thus, respectfully requests the Patent Office withdraw the objection above.

The Patent Office objects to claim 7, line 2, because in "images of the target volume" the term "the" should be replaced with "a." Applicant incorporates the suggestions, and thus, respectfully requests the Patent Office withdraw the objection above.

The Patent Office objects to claim 23, line 2 because "the" should be replaced with "a" in "the corrected digital image." Applicant amends claims 23, asserts that the amended claim is proper, and thus, respectfully requests the Patent Office withdraw the objection above.

The Patent Office objects to claim 24, line 1 because "input" should be deleted from "the providing input." Applicant amends claim 24 to incorporate the recommendation above, and thus respectfully requests the Patent Office withdraw the objection above.

The Patent Office objects to claim 28. Applicant cancels claims 28, and thus, respectfully requests the Patent Office withdraw the objection above.

The Patent Office objects to claim 29, line 1 because "input" should be deleted from "the providing input." Applicant amends claim 29 to incorporate the recommendation above, and thus, respectfully requests the Patent Office withdraw the objection above.

The Patent Office objects to claim 32, line 2 because "a method of adjusting" is repeated. Applicant amends claim 32 as recommended, and thus, respectfully requests the Patent Office withdraw the objection above.

The Patent Office objects to claim 36, line 2 because "the" should be replaced with "a" in "the corrected digital image." Applicant amends claims 36, asserts that the amended claim is proper, and thus, respectfully requests the Patent Office withdraw the objection above.

The Patent Office objects to claim 37, line 1 because "input" should be deleted from "the providing input." Applicant amends claim 37 to incorporate the recommendation above, and thus, respectfully requests the Patent Office withdraw the objection above.

The Patent Office objects to claim 41, line 2. Applicant cancels claim 41, and thus, respectfully requests the Patent Office withdraw the objection above.

The Patent Office objects to claim 42, line 1 because "input" should be deleted from "the providing input." Applicant amends claim 42 to incorporate the recommendation, and thus, respectfully requests the Patent Office withdraw the objection above.

The Patent Office objects to claim 44, line 2 because "the" should be replaced with "a" in "the field". Applicant amends claim 44 to incorporate the suggested recommendation, and thus, respectfully requests the Patent Office withdraw the objection above.

The Patent Office objects to claim 47. Applicant cancels claim 47, and thus, respectfully requests the Patent Office withdraw the objection above.

The Patent Office objects to claim 49, line 2 because "the" should be replaced with "a" in "the target volume". Applicant amends claim 49 to incorporate the above

suggestion, and thus, respectfully requests the Patent Office withdraw the objection above.

The Patent Office objects to claim 53. Applicant cancels claim 53, and thus, respectfully requests the Patent Office withdraw the objection above.

The Patent Office objects to claim 58, lines 5-6 because - -and wherein- - should be inserted before - -cast gantry- -, and - -being- - should be replaced with - -are- -. Applicant amends claim 58 to incorporate the above suggestion, and thus, respectfully requests the Patent Office withdraw the objection above.

#### **IV. Claim Rejections Under 35 U.S.C §102**

The Patent Office rejects claims 1-2, 4-5, 43-44, 46-47 and 55-57 under 35 U.S.C. §102(e) as being anticipated by U.S. Patent Application Publication No. 2003/0048868 to Bailey, et al. ("Bailey"). It is axiomatic that to be anticipated every limitation of a claim must disclosed in a single reference.

Applicant respectfully disagrees with the rejection above and submits that independent claim 1 is patentable over the cited reference for at least the reason that the cited reference does not disclose "adjusting automatically the treatment plan based on movement in the fluoroscopy data image" as required by claim 1.

Bailey discloses positioning patient 62 on table 60, comparing CT scanner slices of the patient with images taken during the planning stage, and moving the table to insure that the target region of the patient is within the region of interest so that it can be exposed to the radiotherapy beam 50 (see paragraphs 48-49). Bailey also discloses adjusting the size and shape of the radiotherapy beam, adjusting the table position, and adjusting the angular position of radiation source 40 automatically, with some or complete control by the therapist, by using a computerized system including computer 80 (see paragraphs 51-53). Moreover, Bailey discloses a suitable

collimator subsystem at 46 so that the cross-sectional shape and size of the radiotherapy beam can be modified (see paragraph 41).

However, the Patent Office has not identified and Applicant is unable to find any disclosure in Bailey that accounts for adjusting a treatment plan based on movement in a fluoroscopy data image, or adjusting automatically a treatment plan. Specifically, the sections cited above disclose adjusting a patient position or radiotherapy beam so that the beam is appropriately aligned with a target region according to a plan. However, the cited sections do not disclose adjusting a treatment plan, or adjusting automatically a treatment plan, as required by claim 1. Hence, for at least the reason that the cited reference does not disclose the limitations of claim 1 noted above, Applicants respectfully request the Patent Office withdraw the rejection above.

Applicant respectfully disagrees with the rejection above and submits that independent claim 4, as amended, is patentable over cited reference for at least the reason that Bailey does not disclose "a third component to adjust the treatment plan based on the simulated execution of the treatment plan," as required by amended claim 4.

As noted above, Bailey teaches adjusting a patients position and adjusting a radiotherapy beam to align the beam with a target region of the patient.

However, the Patent Office does not identify and Applicant is unable to find any disclosure in Bailey of a third component to adjust a treatment plan, or of adjusting a treatment plan based on a simulated execution of the treatment plan, as required by amended claim 4. Specifically, as noted above for claim 1, Bailey does not disclose adjusting a treatment plan, but instead discloses adjusting a beam and patient according to a treatment plan. Also, Bailey does not disclose adjusting a treatment plan based on a simulated execution of the treatment plan. Hence, for at least these reasons, Applicant respectfully requests the Patent Office withdraw the rejection above of claim 4.

Applicant respectfully disagrees with the rejection above and submits that independent claim 43 is patentable over the cited references for at least the reason that Bailey does not disclose "adjusting automatically the treatment plan based on movement in the fluoroscopy data image," as required by claim 43. An argument analogous to the one above with respect to claim 1, applies here as well. Hence, Applicant respectfully requests the Patent Office withdraw the rejection above of claim 43, for at least the reasons cited above with respect to claim 1.

Applicant respectfully disagrees with the rejection above and submits that independent claim 46, as amended, is patentable over the cited references for at least the reason that Bailey does not disclose "a means for adjusting the treatment plan based on the simulated execution of the treatment plan," as required by amended claim 46. An argument analogous to the one above with respect to amended claim 4, applies here as well. Hence, for at least the reasons above with respect to claim 4, Applicant respectfully requests that the Patent Office withdraw the rejection above of claim 46.

Applicant respectfully disagrees with the rejection above and submits that independent claim 56, as amended, is patentable over the cited references for at least the reason that Bailey does not disclose a system that comprises a simulation component "wherein said radiation source is at a fixed position relative to the gantry," as required by amended claim 56. As described in the present specification, at paragraphs 56 and 57, for example, prior art simulation systems required a source that could move in relation to the gantry. Bailey does not teach or suggest a system with a simulation component wherein the radiation source is at a fixed position relative to the gantry.

Hence, Applicant respectfully requests that the Patent Office withdraw the rejection above.

Next, Applicant disagrees with the rejection above and submits that independent claim 57, as amended, is patentable over the cited references because Bailey does not disclose "means to move the patient support as the gantry rotates to maintain a constant distance between the radiation source and a point defined in relation to the patient support," as required by amended claim 57.

As noted above, Bailey discloses aligning a radiotherapy beam with a target region of a patient by adjusting the shape and size of the beam, angular position of the radiation source, and position of the table the patient is on (paragraphs 49-53). Specifically, Bailey describes positioning sources 22 and table 60 to align a radiotherapy beam with a target region of a patient prior to treating the patient (see paragraphs 41, 49 and 51-52). Also, Bailey teaches moving the table to insure that the target region of the patient is within the region of interest so that it can be exposed to the radiotherapy beam 50 (see column 49, lines 1-4). As is well known in the art of treatment, the patient support is positioned such that the target (e.g. a tumor) is at the machine's isocenter. During treatment, because the isocenter is fixed, the target remains at isocenter while the gantry rotates. Bailey thus teaches away from moving the patient support while the gantry rotates, because this would move the target out of the fixed isocenter.

On the other hand, the Patent Office has not identified and Applicant is unable to find any disclosure in Bailey of moving a patient support as the gantry rotates to maintain a constant distance between the radiation source and a point defined in relation to the patient support, as required by amended claim 57. As described in the present specification, for example at paragraph 57, the present invention allows for maintaining a constant distance between the source, and e.g. a target, during rotation, with the capability to provide treatment simulation for machines having different source to isocenter distances, for example. Hence, for at least this reason, Applicant respectfully requests that the Patent Office withdraw the rejection above of claim 57.

The Patent Office rejects claims 4, 6, 8, 46, 48 and 50 under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,901,199 to Murphy, et al. ("Murphy").

Applicant respectfully disagrees with the rejection above and submits that independent claim 4, as amended, is patentable over the cited references for at least the reason that Murphy does not disclose a simulation component to simulate the execution of a treatment plan on a patient, as required by amended claim 4.

Murphy discloses comparing DRRs with x-ray images taken of a treatment target's position taken at the time of treatment (see Abstract).

However, the Patent Office has not identified and Applicant is unable to find any disclosure in Murphy of a simulation component to simulate the execution of a treatment plan on a patient, as required by claim 4. Hence, Applicant respectfully request that the Patent Office withdraw the objection above of claim 4.

Also, Applicant respectfully disagrees with the rejection above and submits that independent claim 46, as amended, is patentable over the cited references for at least the reason that Murphy does not disclose a means for simulating a treatment plan on a patient, as required by amended by claim 46. An argument analogous to the one above with respect to claim 4 applies here as well. Hence, for at least the reasons described above with respect to claim 4, Applicant respectfully requests that the Patent Office withdraw the rejection above of claim 46.

The Patent Office rejects claims 19-29 and 32-42 under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 6,516,046 to Frohlich, et al. ("Frohlich").

Applicant respectfully disagrees with the rejection above and submits that independent claim 19, as amended, is patentable over the cited references for at least the reason that Frohlich does not disclose automatically adjusting one of a



radiation source and an imager of a radiotherapy simulator system, based on input associated with a digital image, as required by amended claim 19.

Frohlich teaches superimposing a reconstructed image and an x-ray image, detecting positional errors, and correcting the location of a patient on the basis of the detected positional errors (see column 2). Frohlich also discloses moving the patient table, in particular automatically operated and corrected by a computer controlled and camera controlled navigation and tracking system with markers on the patient and/or on the patient table ( see column 3, lines 35-43).

However, the Patent Office has not identified and Applicant is unable to find any disclosure in Frohlich of automatically adjusting a radiation source or automatically adjusting an imager of a radiotherapy simulator system, as required by claim 19. Hence, for at least the reason above, Applicant respectfully requests the Patent Office withdraw the rejection above of claim 19.

Also, Applicant respectfully disagrees with the rejection above and submits that independent claim 25, as amended, is patentable over the cited references for at least the reason that Frohlich does not disclose "recalculating a treatment plan based on the input associated with the digital image," as required by amended claim 25.

As noted above, with respect to claim 19, Frohlich discloses moving a patients position to correct the location of a patient on the basis of a positional error between an x-ray image and a reconstructed radiograph from a 3 dimensional set of patient scanning data corresponding to the x-ray image (see column 2, lines 25-35).

However, the Patent Office has not identified and Applicant is unable to find any disclosure in Frohlich of recalculating a treatment plan based on the input associated with the digital image, as required by amended claim 25. Specifically, Frohlich discloses correcting a patient's position automatically, but does not disclose recalculating a treatment plan as required by amended claim 25. Hence, for at least

the reason described above, Applicant respectfully requests that the Patent Office withdraw the rejection above.

In addition, Applicant respectfully disagrees with the rejection above and submits that independent claim 32, as amended, is patentable over the cited references for at least the reason that Frolich does not disclose automatically adjusting one of a radiation source and an imager of a radiotherapy simulator system based upon an input associated with a digital image, as required by amended claim 32. An argument analogous to the one above with respect to claim 19 applies here as well. Hence, for at least the reasons given above with respect to claim 19, Applicant respectfully requests that that the Patent Office withdraw the rejection above of claim 32.

Next, Applicant respectfully disagrees with the rejection above and submits that independent claim 38, as amended, is patentable over the cited references for at least the reason that Frohlich does not disclose "recalculating a treatment plan based on the input associated with the igital image," as required by amended claim 38. An argument analogous to the one above with respect to claim 25 applies here as well. Hence, for at least the reasons given above with respect to claim 25, Applicant respectfully requests that the Patent Office withdraw the rejection above of claim 38.

Any dependent claims not mentioned above are submitted as not being anticipated or obvious, for at least the same reasons given above in support of their base claims.

#### **V. Claims Rejected Under 35 U.S.C §103**

The Patent Office rejects claims 3 and 45 under 35 U.S.C. §103(a) as being unpatentable over Bailey, as applied to claims 1 and 43 above, and further in view of

U.S. Patent No. 5,764,723 to Weinberger, et al. ("Weinberger"). To render a claim obvious, all limitations of that claim must be taught or suggested by at least one properly combined reference.

Applicant submits that dependent claims 3 and 45 being dependent upon allowable base claims 1 and 43 are patentable over the cited references for at least the reasons stated above. Thus, Applicant respectfully requests that the Patent Office withdraw the rejection above.

The Patent Office rejects claim 7 and 49 under 35 U.S.C. §103(a) as being unpatentable over Murphy as applied to claims 6 and 48 above, and further in view of U.S. Patent Application Publication 2003/0007601 to Jaffray, et al. ("Jaffray").

Applicant submits that dependent claims 7 and 49 being dependent upon allowable base claims 4 and 46 are patentable over the cited references for at least the reasons stated above. Thus, Applicant respectfully request that the Patent Office withdraw the rejection above.

The Patent Office rejects claims 9 and 51 under 35 U.S.C. §103(a) as being unpatentable over Murphy, as applied to claims 6 and 48 above, and further in view of Frohlich.

Applicant submits that claims 9 and 51 being dependent upon allowable base claims 4 and 46 are patentable over the cited references for at least the reasons explained above. Thus, Applicant respectfully requests that the Patent Office withdraw the rejection above.

The Patent Office rejects claim 52 under 35 U.S.C. §103(a) as being unpatentable over Bailey in view of Jaffray.

Applicant respectfully disagrees with the rejection above and submits that independent claim 52, as amended, is patentable over the cited references because the references do not teach or suggest performing brachytherapy comprising producing a treatment plan for placement of a radiation source while the patient is on the patient support, as required by amended claim 52.

As noted above, with respect to claim 1, Bailey teaches adjusting a position of a patient and/or a radiotherapy beam according to a treatment plan.

Jaffray teaches implanting radio-opaque markers on a lesion (see paragraph 11).

However, the Patent Office has not identified and applicants are unable to find any teaching or suggestion in Murphy or Jaffray of performing brachytherapy comprising producing a treatment plan for placement of a radiation source while the patient is on the patient support, as required by claim 52. As known in the industry, brachytherapy includes a temporary radiation implant, or a permanent implant of a radioactive seed. On the other hand, Jaffray describes radio-opaque markers, but not implanted radiation sources, or producing a treatment plan for placement of a radiation source while the patient is on the patient support. Hence, since neither Bailey, Jaffray, nor the combination, teaches or suggests the above noted limitation of claim 52, Applicant respectfully requests that the Patent Office withdraw the rejection above.

The Patent Office rejects claims 58 and 59 under 35 U.S.C. §103(a) as being unpatentable over Mori et al. "Development of Advanced Multislice CT Scanner

Aquilion”, in view of Toshiba “Clinical Performance: Delivering upon the Promise of Multi-slice CT through Proven Performance”.

Applicant disagrees with the rejection above and submits that independent claim 58, as amended, is patentable over the cited references because Toshiba does not teach or suggest a gantry that “comprises a single cast frame, wherein the frame comprises a first elongate portion and a second elongate portion disposed at an angle to one another,” as required by amended claim 58.

The Patent Office has not identified and Applicant is unable to find any teaching or suggestion in Mori of a single cast gantry, as claimed by amended claim 58.

Toshiba teaches an aluminum, rigid, die-cast gantry (page 3, col. 1, lines 28-31).

The gantries of both Mori and Toshiba are “closed” or “ring” gantries as are well known in the art of CT imaging.

However, the Patent Office has not identified and Applicant is unable to find any teaching or suggestion in Toshiba of a single gantry having a cast frame and having two elongate portions disposed at an angle to one another, as required by amended claim 58. Hence, for at least this reason, Applicant respectfully requests that the Patent Office withdraw the rejection above of claim 58.

Any dependent claims not mentioned above are submitted as not being anticipated or obvious, for at least the same reasons given above in support of their base claims.

### CONCLUSION

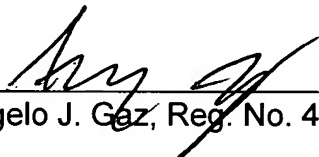
In view of the foregoing, it is believed that all claims now pending patentably define the subject invention over the prior art of record and are in condition for allowance, and such action is earnestly solicited at the earliest possible date.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2666 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17.

If a telephone interview would expedite the prosecution of this Application, the Examiner is invited to contact the undersigned at (310) 207-3800.

Respectfully submitted,  
BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN LLP

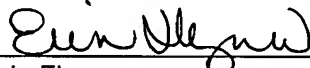
Date: September 16, 2005

  
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### CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail with sufficient postage in an envelope addressed to: Mail Stop Amendment, Commissioner for Patents, P. O. Box 1450, Alexandria, VA 22313-1450 on September 16, 2005.

  
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Erin Flynn September 16, 2005